



Thunder Spirit Wind, LLC | 30 West Superior Street | Duluth, MN 55802-2093
218-355-3232 | alletecleanenergy.com

Daniel P. McCourtney

218-355-3515

E-mail: dmccourtney@mnpower.com

October 9, 2018

Mr. Jerry Lein
North Dakota Public Service Commission
Public Utilities Division
600 E Boulevard Ave, Dept. 408
Bismarck, ND 58505-0480

Subject: Clean Energy 1 Wind Project
Submittal of Engineering Drawings (Mercer County)
Case No. PU-11-662

Dear Mr. Lein,

On August 29, 2012 the North Dakota Public Service Commission (PSC) approved a Certificate of Site Compatibility (Certificate) to ALLETE Clean Energy for the Clean Energy 1 Wind Project (Project). The Certificate was subsequently amended on September 6, 2018. ALLETE Clean Energy will be continuing Project construction throughout 2018 in Mercer County, ND in accordance with the attached engineering drawings.

If any additional information is required by the PSC for approval please contact me at 218.355.3515 or electronically at dmccourtney@allette.com.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Daniel McCourtney", with a stylized, sweeping flourish at the end.

Daniel McCourtney

DPM:sr

cc: Wells McGiffert
John Hollingsworth
David Moeller

61 PU-11-662 Filed 10/09/2018 Pages: 17
Engineering Drawings
Allete Clean Energy, Inc.
Daniel McCourtney

Civil Construction Plans

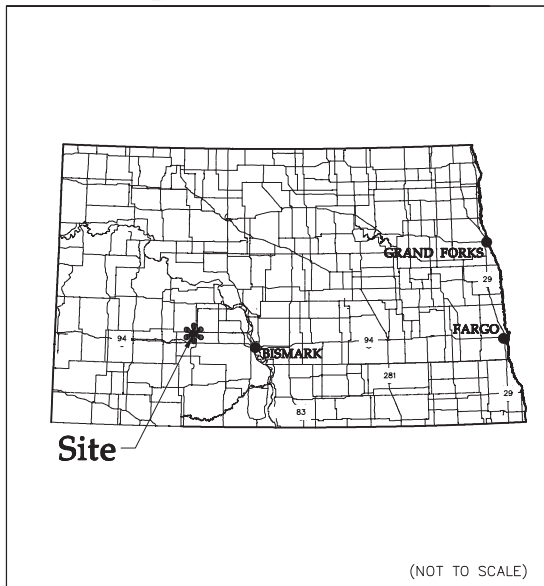
for

Wind Turbines, Access Roads, Drainage, and Erosion Control

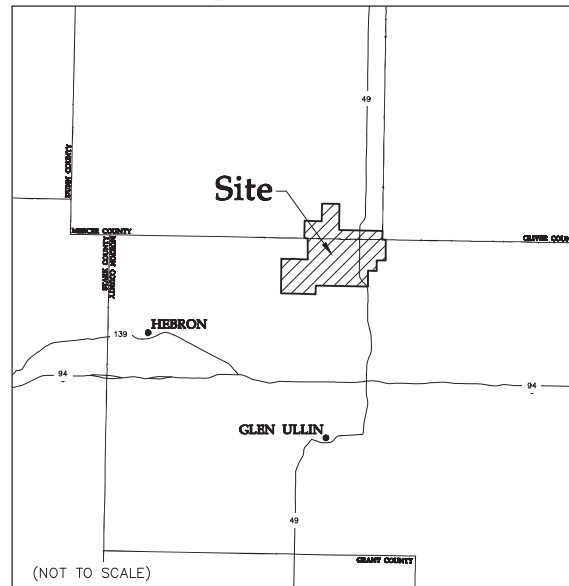
Glen Ullin Energy Center

Mercer and Morton Counties, North Dakota

State Map



Vicinity Map



Sheet List Table	
Sheet Number	Sheet Title
1	COVER
2	OVERALL SITE PLAN
3	DELIVERY FLOW PLAN
4	CONSTRUCTION DETAILS
5	CONSTRUCTION DETAILS
6	CONSTRUCTION DETAILS
7	CONSTRUCTION DETAILS
8	CONSTRUCTION DETAILS
9	CONSTRUCTION DETAILS
10	CONSTRUCTION NOTES
11	CIVIL PLAN SET 3
12	CIVIL PLAN SET 1 2
13	CIVIL PLAN SET 6 7 ALT 2
14	CIVIL PLAN SET 4 5
15	CIVIL PLAN SET 1
16	CIVIL PLAN SET 0&M & SUBSTATION
17	CIVIL PLAN SET 10 11 17
18	CIVIL PLAN SET 8 13 18 19
19	CIVIL PLAN SET 9 10 20
20	CIVIL PLAN SET 21 31 39 41 42
21	CIVIL PLAN SET 32 40 43
22	CIVIL PLAN SET ALT 1
23	CIVIL PLAN SET 14 15 24 25 26
24	CIVIL PLAN SET 16 28
25	CIVIL PLAN SET 29 30
26	CIVIL PLAN SET 35 36 37 38
27	CIVIL PLAN SET 22 27
28	CIVIL PLAN SET 23
29	CIVIL PLAN SET 4
30	CIVIL PLAN SET 33 34

Westwood

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Designed: DJP
Checked: DJP
Drawn: DJP

As-Built Drawing

Revisions	DATE	DESCRIPTION
A	08/22/18	30% CIVIL PLANS
B	09/19/18	30% CIVIL PLANS REVISED
C	09/26/18	ISSUED FOR PERMITTING
D	10/02/18	60% CIVIL PLANS

Prepared for:

WANZEK
a MacTec company

3025 2nd Avenue NW
West Fargo, ND 58078

Glen Ullin Energy Center

Mercer and Morton Counties,
North Dakota

Cover

**60% Completion
NOT FOR CONSTRUCTION**

Date: 10/02/18

Sheet: 1 OF 30

0012656CV.dwg

DATA SET INFORMATION			
BASE FILE	FILE NAME / NOTES	PROVIDER	DATE
AERIAL IMAGE	World_IMG_Dt_2018_08_02.jp2	ESRI	9/5/2017
LAND CONTROL	CE3_Project_Boundary_Current.shp	Wanzek	7/27/2017
TOPOGRAPHY	MAP_L0&M.txd	NRCS North Dakota Lidar	1/1/2016
TURBINE ARRAY	20180926_GUEC_Renumbered_Coordinates.xlsx	Wanzek	9/27/2018
UNDERGROUND COLLECTION	Glen Ullin Energy Center Collection Layout_09_28_20	Wanzek	9/28/2018
STREAMS/WETLANDS	Hydrography_NHD04K_nd057_3612803_02.zip	NHD	8/2/2018
FEMA INFO	FEMA_NO_X.shp	FEMA	1/1/2018

LEGEND:

- TURBINE LOCATION
- XXX TURBINE NUMBER
- ALTERNATE TURBINE LOCATION
- XXX ALTERNATE TURBINE NUMBER
- EXISTING PTC ACCESS ROAD
- PROPOSED ACCESS ROAD
- ALTERNATE PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- EXISTING ROAD
- ▨ OUTSIDE OF PROJECT BOUNDARY

XX

SHEET NUMBER

ITEM	LENGTH
ACCESS ROAD	13.5 mi
CRANE PATH	7.6 mi
PTC ACCESS ROAD	1.1 mi

*ACCESS ROAD LENGTH INCLUDES SPUR ROADS

Designed: DGP
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Glen Ullin Energy Center

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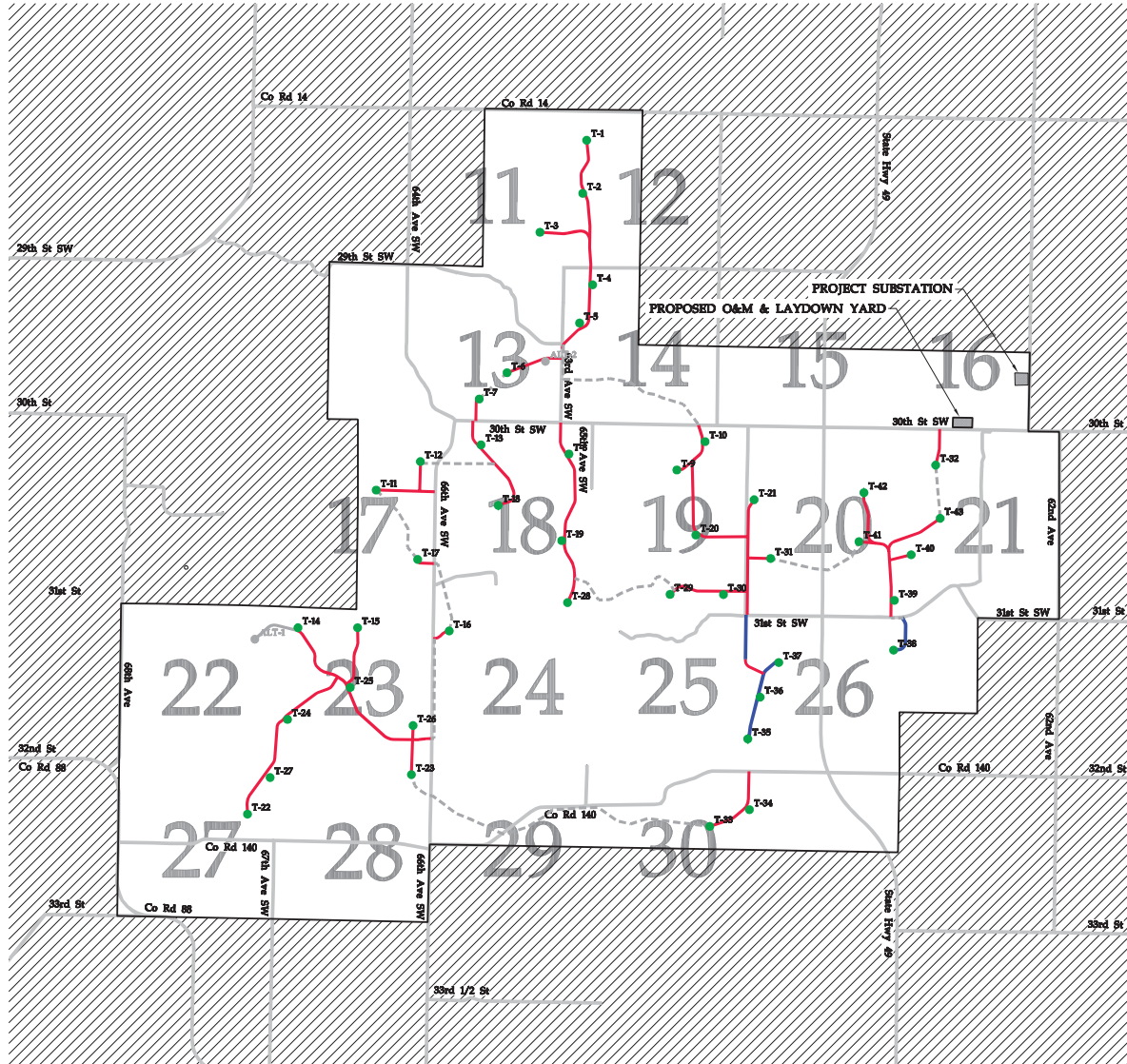
Overall Site Plan

60% Completion
NOT FOR CONSTRUCTION

Date: 10/02/18

Sheet: 2 OF 30

0012656CA01.dwg



LEGEND:

- TURBINE LOCATION
- XXX TURBINE NUMBER
- ALTERNATE TURBINE LOCATION
- XXX ALTERNATE TURBINE NUMBER
- EXISTING PTO ACCESS ROAD
- PROPOSED ACCESS ROAD
- ALTERNATE PROPOSED ACCESS ROAD
- EXISTING ROAD
- OUTSIDE PROJECT BOUNDARY
- PAVED DELIVERY ROUTE
- GRAVEL DELIVERY ROUTE
- ↗ or ↘ INTERSECTION IMPROVEMENTS
- DELIVERY ROUTE DIRECTION

ITEM	LENGTH
GRAVEL DELIVERY ROUTE	6.75 mi

Designed: DGP
Checked: DGP
Drawn: DGP

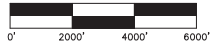
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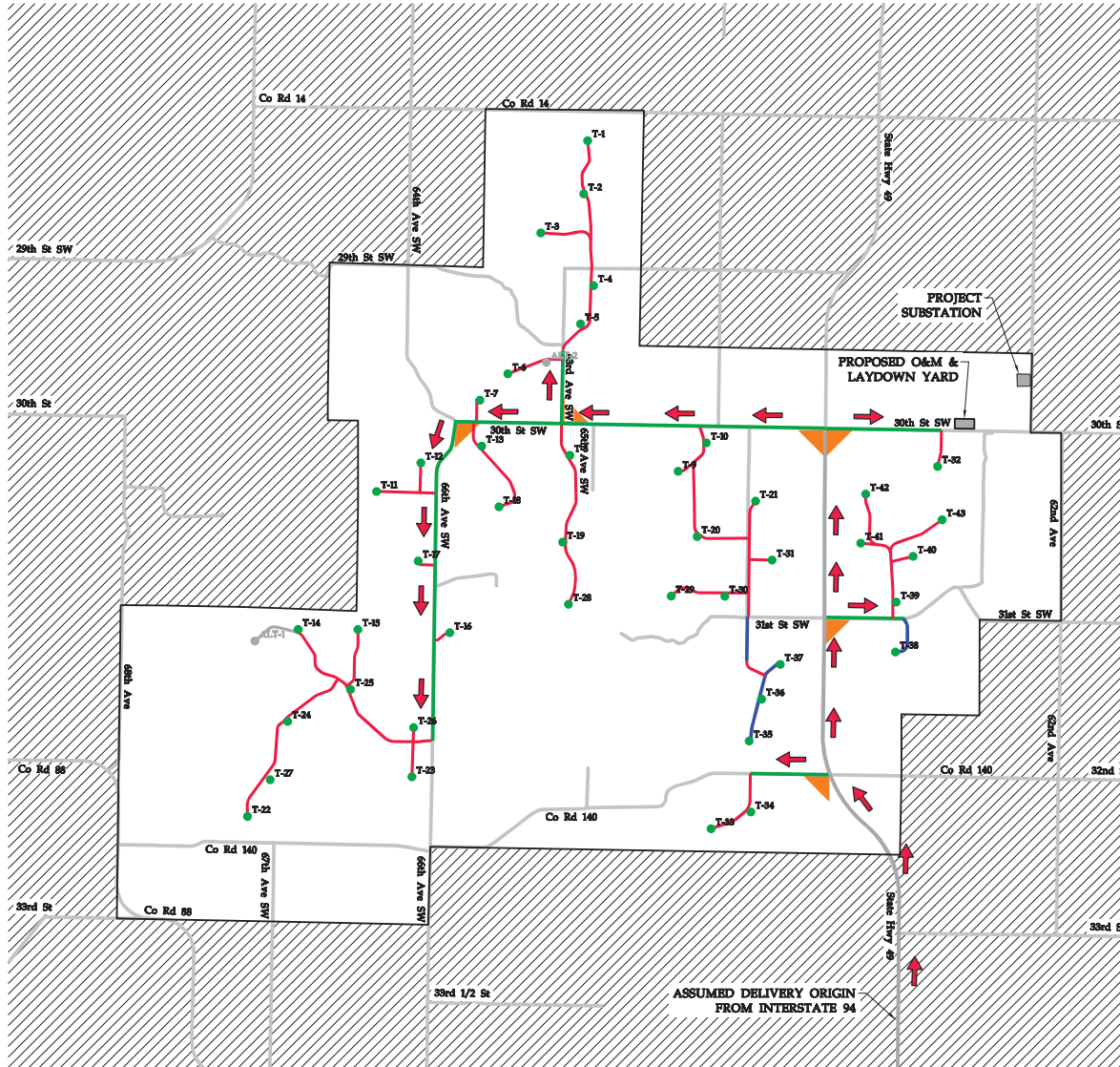
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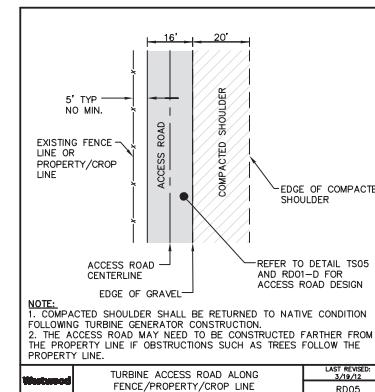
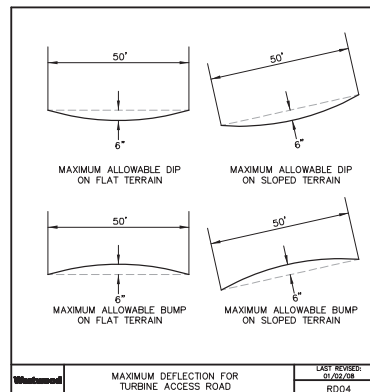
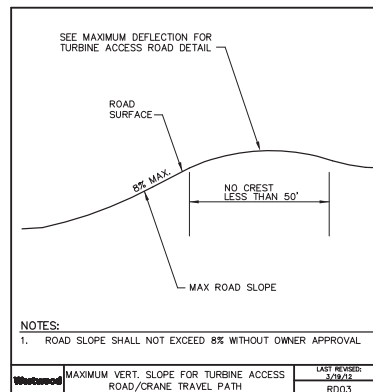
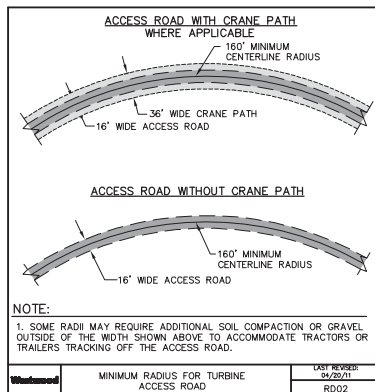
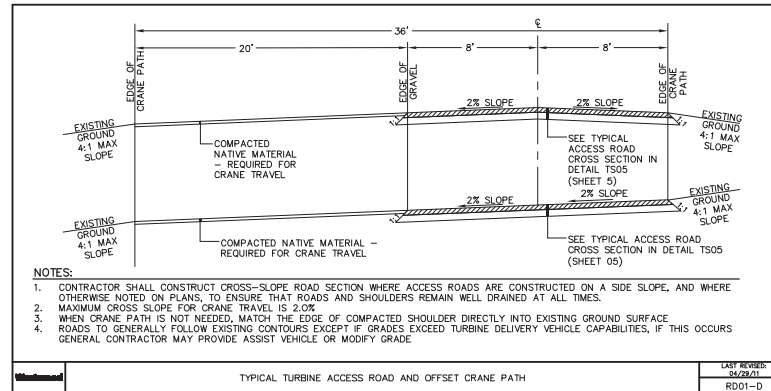
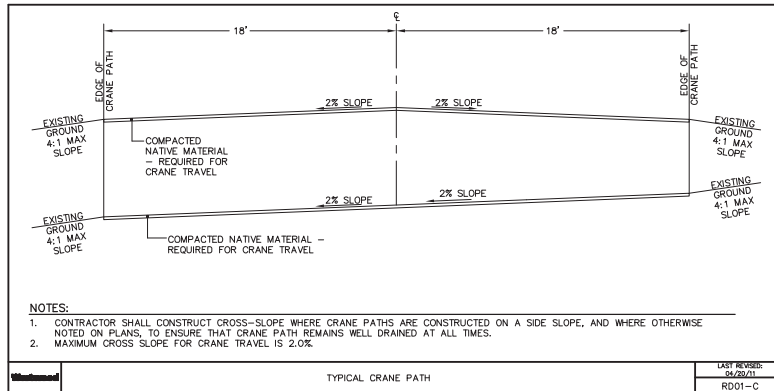
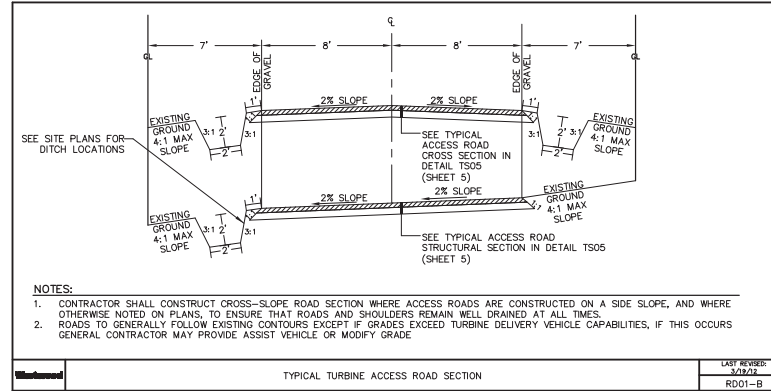
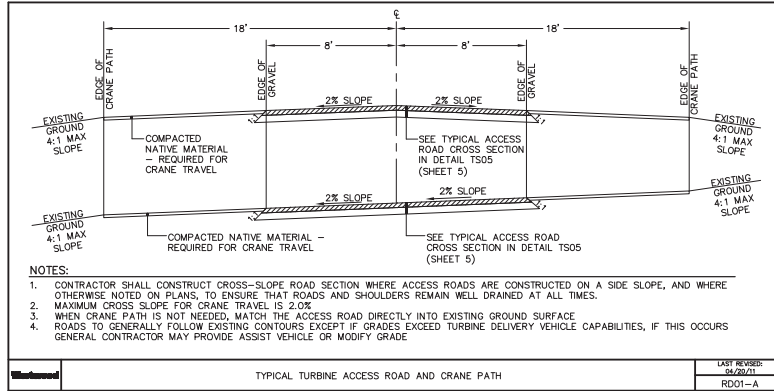
60% Completion
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Date: 10/02/18

Sheet: 3 OF 30

00128560FP.dwg





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Drawn: GSK

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WANZEK
a MasTec company

2025 2nd Avenue NW
West Fargo, ND 58078

Glen Ullin Energy Center

Mercer and Morton Counties,
North Dakota

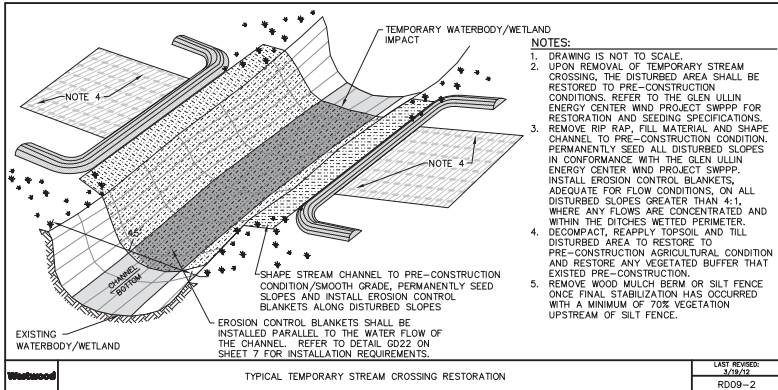
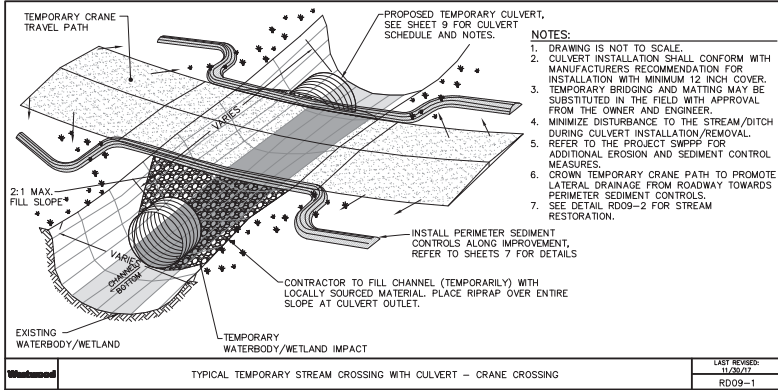
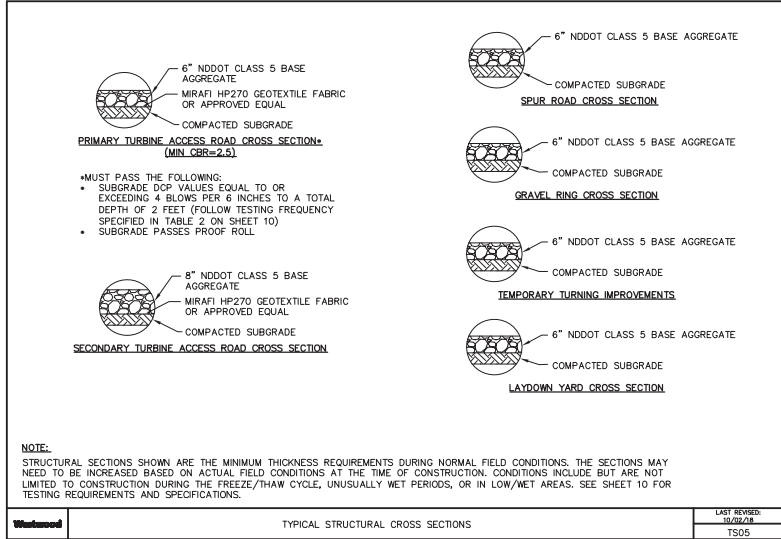
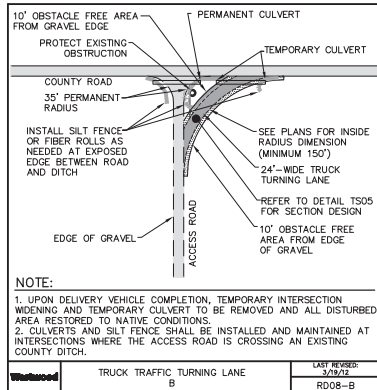
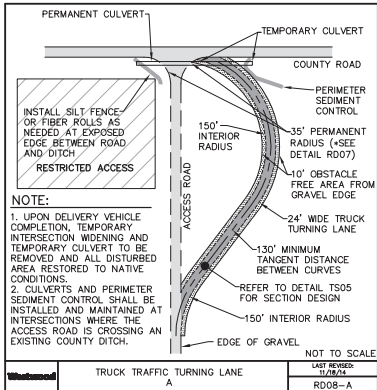
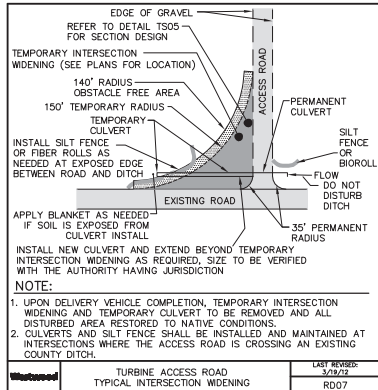
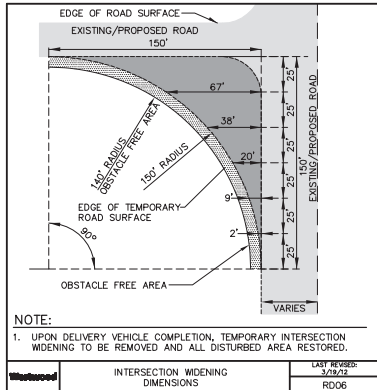
Construction Details

60% Completion
NOT FOR CONSTRUCTION

Date: 10/02/18

Sheet: 4 OF 30

00128560 TP.dwg



Designed:	DJP	
Checked:	DJP	
Drawn:	DKK	
As-Built Drawing		
Revisions		
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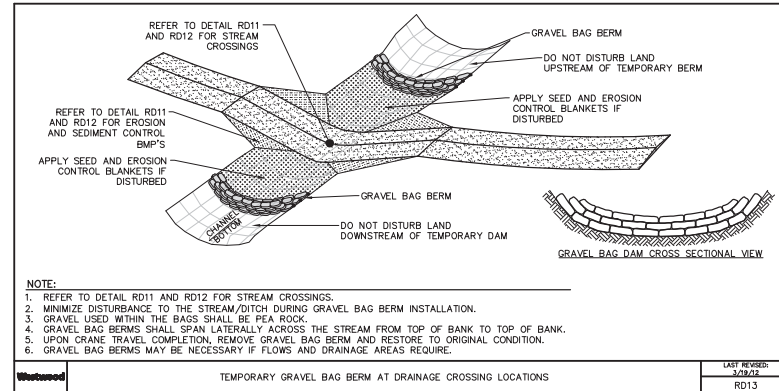
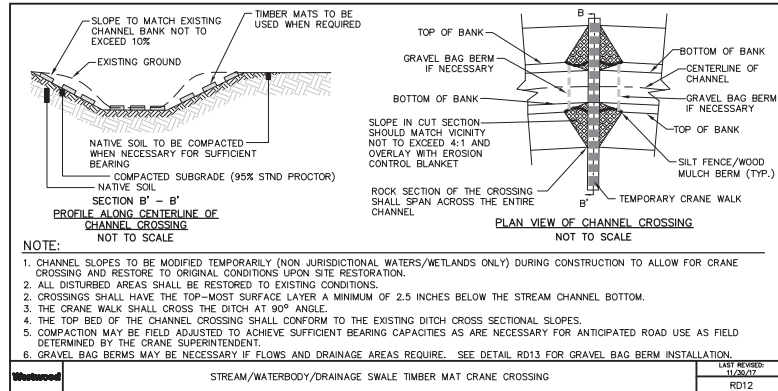
Glen Ullin Energy Center

Mercer and Morton Counties,
North Dakota

Construction Details

60% Completion
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Date: 10/02/18
Sheet: 5 OF 30



**Glen Ullin
Energy Center**

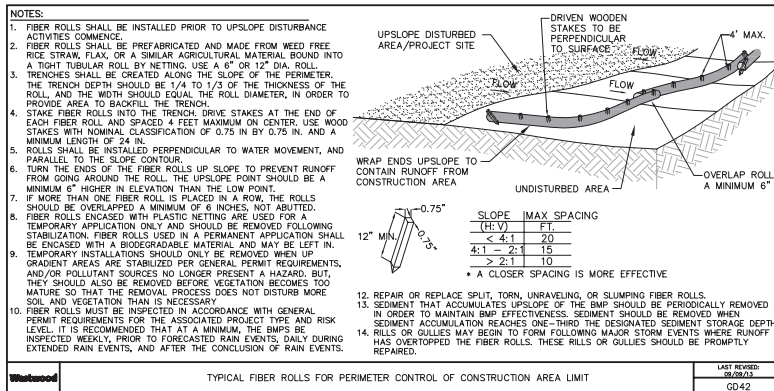
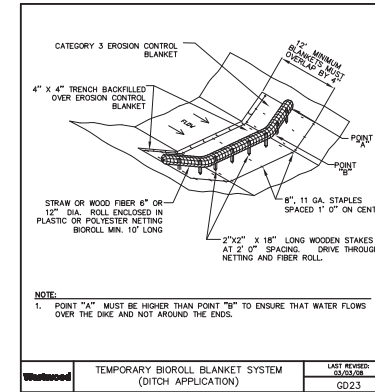
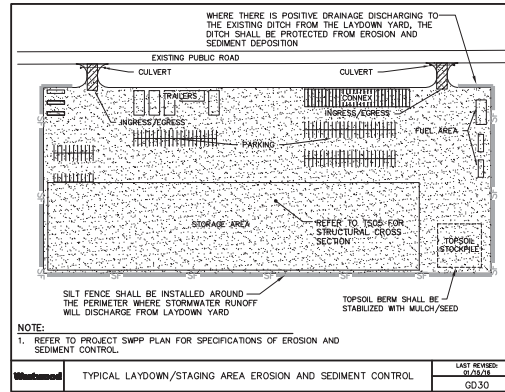
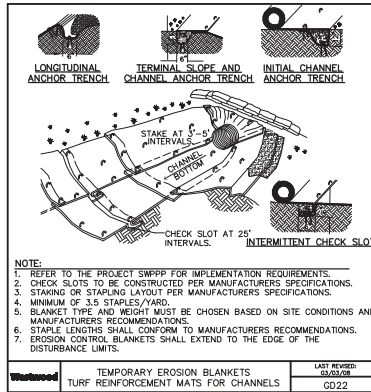
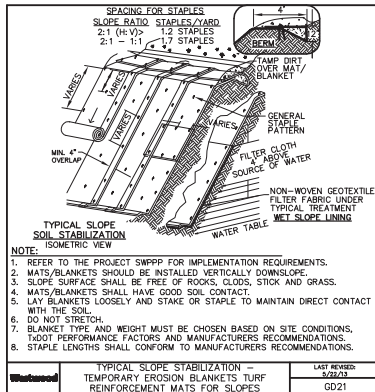
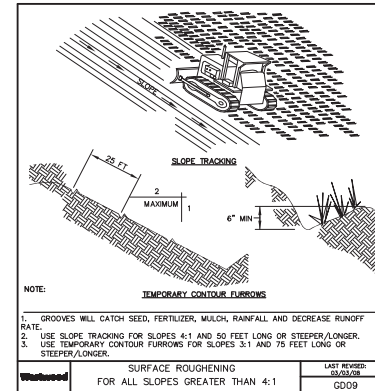
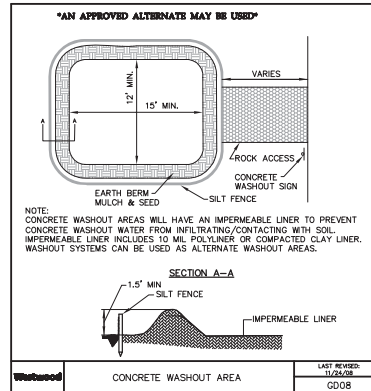
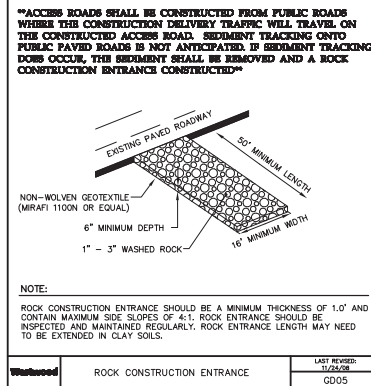
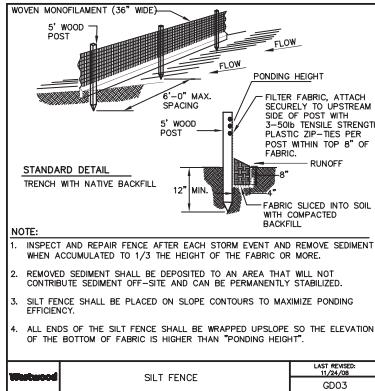
**Mercer and Morton Counties,
North Dakota**

Construction Details

60% Completion
NOT FOR CONSTRUCTION

Date: 10/02/18
Sheet: 6 OF 30

00126560TP.dwg



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Glen Ullin Energy Center

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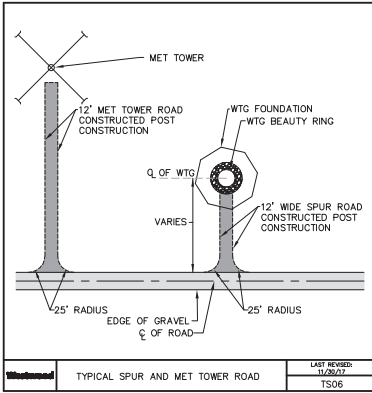
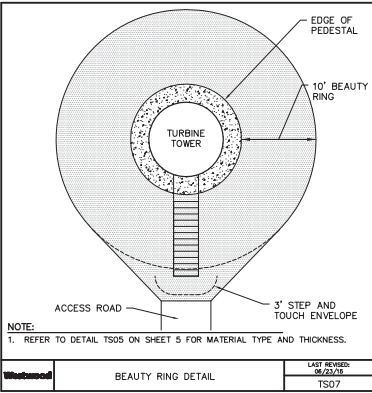
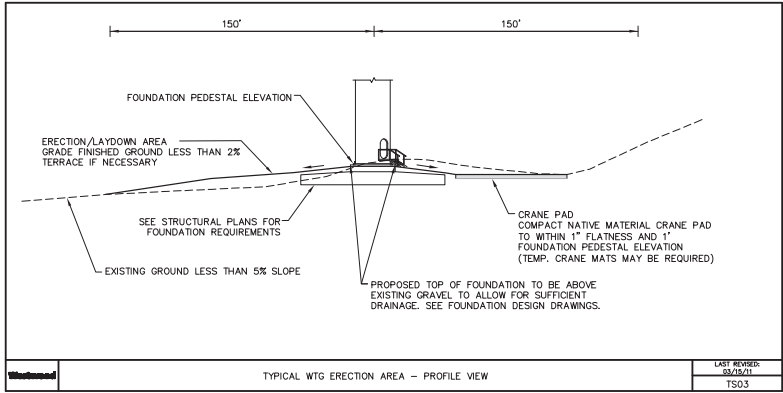
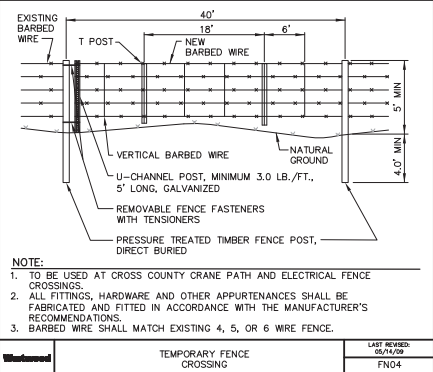
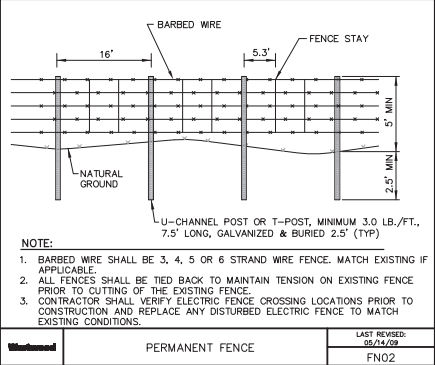
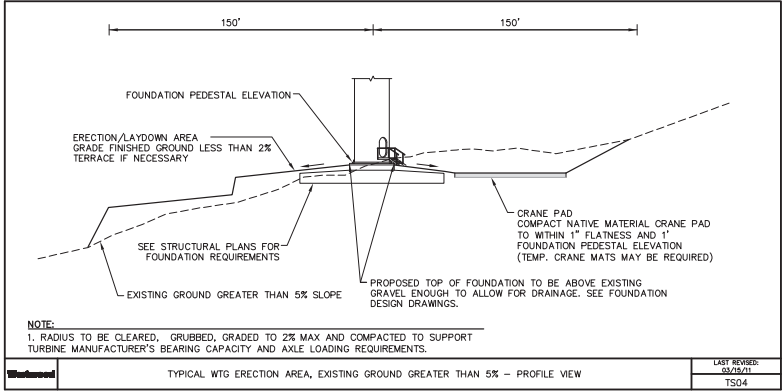
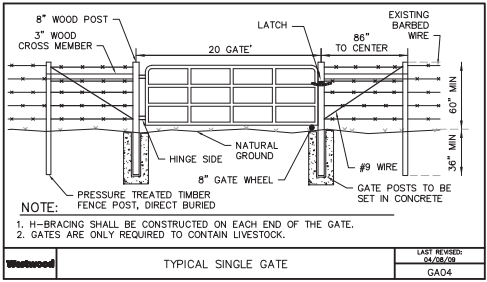
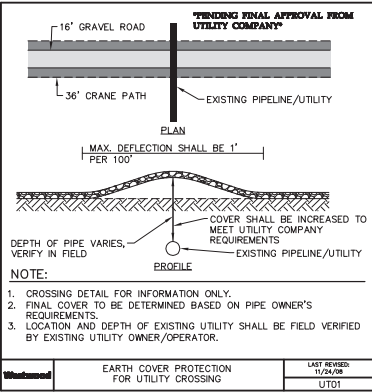
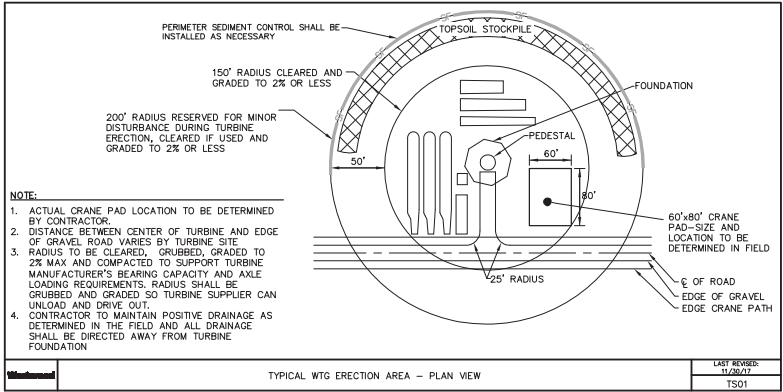
Construction Details

60% Completion
NOT FOR CONSTRUCTION

Date: 10/02/18

Sheet: 7 OF 30

00128560 TP.dwg



Designed:	DJP
Checked:	DJP
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As-Built Drawings:	
Revisions:	
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Glen Ullin Energy Center

Mercer and Morton Counties,
North Dakota

Construction Details

60% Completion
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TURBINE COORDINATES
(HARN/NORTH DAKOTA STATE PLANE - SOUTH ZONE, US FOOT)

Turbine Number	Northing	Easting
T-1	491808.162609	1637973.452878
T-2	490011.074228	1637840.662097
T-3	488693.640309	1636393.597548
T-4	486917.257223	1638175.666035
T-5	485622.758764	1637734.668993
T-6	483941.535006	1635280.854503
T-7	483051.128518	1634339.339541
T-8	481190.183725	1637373.602488
T-9	480650.073611	1641025.537042
T-10	481609.605985	1641978.862074
T-11	479969.261275	1630852.115757
T-12	480935.885922	1632346.595934
T-13	481500.511555	1634398.635650
T-14	475312.137000	1628206.099996
T-15	475311.797426	1630223.040608
T-16	475203.628600	1633322.704077
T-17	477623.966818	1632255.975298
T-18	479451.460853	1634982.559716
T-19	478259.166684	1637131.319553
T-20	478447.933655	1641668.172032
T-21	479643.863623	1643639.889482
T-22	469003.889092	1626499.150508
T-23	470340.466505	1632044.029034
T-24	472208.751993	1627851.626139
T-25	473289.409860	1629973.147006
T-26	472001.562313	1632100.744736
T-27	470242.204802	1627262.749047
T-28	476162.947167	1637326.394596
T-29	476439.787262	1640794.674136
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T-36	472961.679698	1643843.563078
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T-40	477780.694015	1648954.335379
T-41	478225.774313	1647187.320095
T-42	479882.493732	1647355.649288
T-43	479013.379367	1649934.586868
ALT-1	474923.590208	1626746.459981
ALT-2	484327.337459	1636579.155231

CULVERT AND LOW WATER CROSSING SCHEDULE
TO BE ADDED AT A LATER DATE

PUBLIC ROAD ENTRANCE CULVERTS SCHEDULE
TO BE ADDED AT A LATER DATE

Westwood

Phone (862) 937-5150 12701 Whiteaker Drive, Suite #300
Fax (862) 937-5522 Minneapolis, MN 55443
Toll Free (888) 937-5150 www.westwoodps.com
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Energy Center**

**Mercer and Morton Counties,
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Date: 10/02/18

Sheet: 9 OF 30

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF NDDOT SPECIFICATION 302 AND 816 (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE NORTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR MERCER AND MORTON COUNTIES. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAUGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
- A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
- A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
- B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. EMBANKMENT CONSTRUCTION
- A. EMBANKMENT CONSTRUCTION SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, EMBANKMENTS SHALL HAVE COMPACTED SUPPORT SLOPES OF FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR EMBANKMENT CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 8".
- B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
4. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES SHALL NOT EXCEED 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 9 FOR CURVING SIZE AND DESIGN PARAMETERS. CULVERTS HAVE BEEN DESIGNED TO A 25 YEAR/24 HOUR STORM EVENT. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE OR HDPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN. ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TABLE 1: NDDOT CLASS 5 BASE AGGREGATE – LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	90-100
NO. 4	35-70
NO. 30	16-40
NO. 200	4-10
MEET FOLLOWING REQUIREMENTS FOR NDDOT CLASS 5 BASE AGGREGATE:	
AT LEAST 10 PERCENT BY WEIGHT OF THE AGGREGATE RETAINED ON THE NO. 4 SIEVE HAS AT LEAST ONE MECHANICALLY FRACTURED FACE FOR CLASS 5.	
SHALE (MAX %) = 12.0% L.A ABRASION (% MAX) = 50%	
MAXIMUM PI = 10 - ((% PASSING NO. 40)/10)	
GRADATION HAS BEEN OBTAINED FROM THE 2014 NORTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK, SECTION 816.02	

TESTING

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL MATERIAL:
A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMITS ON FINES CONTENT, AND PROCTOR TESTS.
- B. IN ROADWAY CUT AREAS, OR WHERE EMBANKMENT CONSTRUCTION REQUIRES LESS THAN 12 INCHES OF FILL PLACEMENT, COMPACT TO A MINIMUM OF 95 PERCENT OF THE MATERIALS MAXIMUM STANDARD PROCTOR DRY DENSITY. THE SCARIFICATION DEPTH SHALL BE ADJUSTED SUCH THAT THE COMBINED THICKNESS OF THE EMBANKMENT FILL MATERIAL AND SCARIFICATION DEPTH SHALL BE 12 INCHES OR GREATER.
2. COMPACTED SUBGRADE:
A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE
- B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD, OR ONE FOR EVERY 1,000 L.F. OF ROAD, WHICHEVER IS GREATER. ADDITIONAL DCP TESTING MAY BE REQUIRED IN AREAS OF FAILING PROOF ROLL. PRIMARY ACCESS ROAD CROSS SECTION REQUIRES A MINIMUM DCP OF 4 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=2.5).
- C. IF EITHER THE PROOF ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
a. SCARIFY, DRY, AND RECOMPACT SUBGRADE AND PERFORM ADDITIONAL PROOF ROLL AND DCP.
b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH 3 INCH MINUS CRUSHED AGGREGATE BASE.
- D. PROVIDE 3 MOISTURE DENSITY COMPACTION TESTS PER ACCESS ROAD, OR ONE FOR EVERY 1000 L.F. OF ROAD LENGTH, WHICHEVER IS GREATER. COMPACTED SUBGRADE MUST BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR.
3. AGGREGATE BASE:
A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
- B. PROVIDE 1 SIEVE ANALYSIS PER 2500 CY OF ROAD BASE PLACED AND LA ABRASION TEST.
- C. PROVIDE AT LEAST 1 DCP TEST PER 1000 L.F. OF ROAD.
4. CRANE PADS:
A. MOISTURE DENSITY TESTING SHALL BE PERFORMED AT A MINIMUM OF 2 PER CRANE PAD. CRANE PADS MUST BE COMPACTED TO A MINIMUM OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT FOR GRANULAR SOILS AND AT -1 TO +2% OF OPTIMUM MOISTURE CONTENT FOR COHESIVE SOILS.
- B. ALL CRANE PADS MUST BE PROOF ROLLED PRIOR TO UTILIZATION.
- C. IF THE CRANE PAD CANNOT ACHIEVE PROOF-ROLL ACCEPTANCE AS DETERMINED BY THE GEOTECHNICAL ENGINEER, DCP TEST MAY BE USED. WHEN UTILIZED, DCP TESTING SHALL BE USED AT MINIMUM RATE OF 2 PER CRANE PAD AND ACHIEVE A MAXIMUM OF 24 MM/BLOW.
- D. AT THE CONTRACTOR'S DISCRETION, CRANE MATS MAY BE UTILIZED TO PROVIDE ADDITIONAL STABILITY.
5. CRANE PATHS / CRANE TRAVEL SHOULDERS
A. CRANE PATHS AND CRANE TRAVEL SHOULDERS SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH.
- B. WHERE REQUIRED TO SUPPORT CRANE TRAVEL AS DETERMINED BY THE CRANE SUPERINTENDENT, SCARIFY AND COMPACT EXISTING SOILS TO A DEPTH OF 6-INCHES AND TO A MINIMUM OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT FOR GRANULAR SOILS AND AT -1 TO +2% OF OPTIMUM MOISTURE CONTENT FOR COHESIVE SOILS.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
STRUCTURAL FILL	GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMITS ON FINES CONTENT, AND PROCTOR	1 PER MAJOR SOIL TYPE
	PROOF-ROLL	ENTIRE LENGTH
COMPACTED SUBGRADE	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 FT OR MIN. 3 PER ROAD
	DCP	1 PER 1000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND LA ABRASION	1 PER 2,500 CY
CRANE PAD COMPACTED SUBGRADE	PROOF-ROLL	ENTIRE AREA
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	2 PER PAD
	DCP (NOT REQUIRED UNLESS PROOF ROLL FAILS)	2 PER PAD
CRANE SHOULDERS	PROOF-ROLL	ENTIRE LENGTH

GENERAL NOTES

1. THE GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON LIDAR DATA OBTAINED FROM THE STATE OF NORTH DAKOTA. THE ELEVATIONS AND CONTOURS BASED ON THE LIDAR DATA WERE PREPARED FROM AERIAL PHOTOGRAPHY DATA, AND NOT ACTUAL FIELD SURVEYING. AS SUCH, THE ACCURACY OF THE ELEVATIONS AND CONTOURS IS NOT AS HIGH AS INFORMATION GATHERED USING CONVENTIONAL FIELD SURVEYING PROCEDURES. THE CONTRACTOR MAY FIND THAT GROUND ELEVATIONS DETERMINED DURING FIELD STAKING WILL VARY FROM THE GROUND ELEVATIONS SHOWN ON THE DRAWINGS. IF MAJOR DISCREPANCIES ARE FOUND, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RANWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY NORTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE ROAD RETURNED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE NOT BEEN PROVIDED. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY METHAD INFORMATION HAS NOT BEEN PROVIDED. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAS NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL ADJUSTMENTS TO THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 100 LF WIDTH FOR PROPOSED ACCESS ROADS AND 100 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 200 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. TRUCK TURNAROUNDS ARE NOT SHOWN ON THE PLANS. GENERAL CONTRACTOR TO COORDINATE AND ASSIST WITH TRUCK TURNAROUNDS WHERE NECESSARY.
20. AN ALTA SURVEY HAS NOT BEEN PROVIDED. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.
21. OFF SITE TEMPORARY INTERSECTION IMPROVEMENTS ARE NOT SHOWN ON THE PLANS.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE NORTH DAKOTA DEPARTMENT OF HEALTH AND BEINGS IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE GLEN ULLIN ENERGY CENTER WIND PROJECT, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE NORTH DAKOTA DEPARTMENT OF HEALTH AND THE GLEN ULLIN ENERGY CENTER WIND PROJECT STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ALLETTE CLEAN ENERGY	JOHN HOLLINGSWORTH	218-355-3249
PROJECT MANAGER	WESTWOOD	DANI FRANSENSEN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	TEOCHEN CLOUD	701-433-5875
NDDOH			701-328-5150

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Westwood Professional Services, Inc.

Designed by	DP
Checked by	DP
Drawn by	DKK

As-Built Drawings

Revised Date Description	
A 08/22/18	30% CIVIL PLANS
B 09/19/18	30% CIVIL PLANS REVISED
C 09/26/18	ISSUED FOR PERMITTING
D 10/02/18	60% CIVIL PLANS

Prepared for:



2025 2nd Avenue NW
West Plains, ND 58578

Glen Ullin
Energy Center

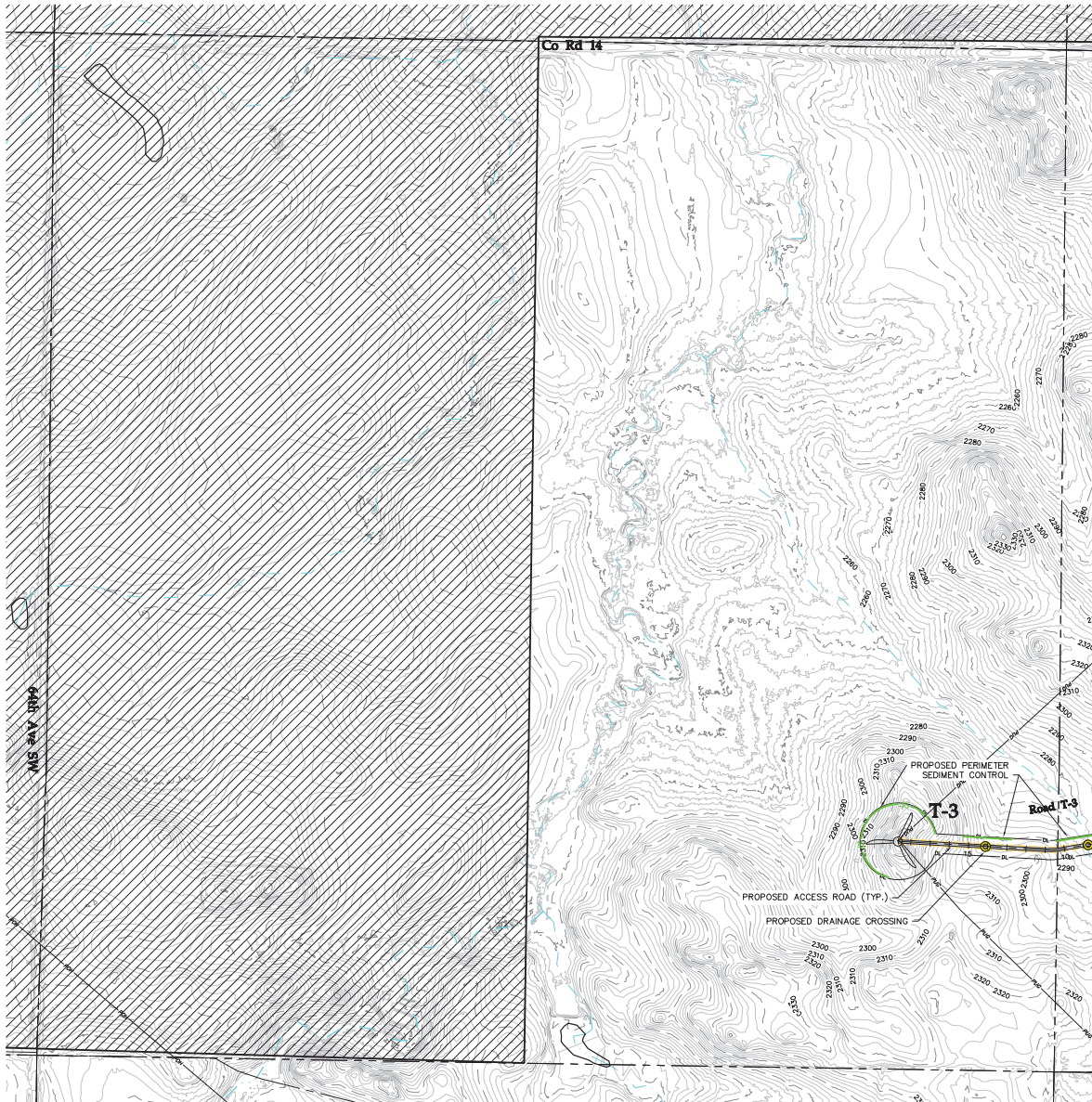
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North Dakota

Construction Notes

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Sheet: 10 OF 30



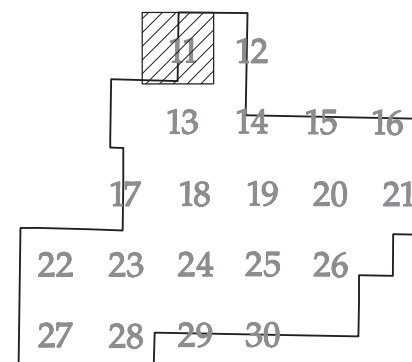
SEE SHEET 13

LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- PROPOSED ACCESS ROAD
- PTC ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED COLLECTION LINE*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED SILT FENCE
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING SECTION LINE (GIS BASED)
- EXISTING ROAD (GIS BASED)
- EXISTING OVERHEAD POWER
- EXISTING PIPE LINE
- EXISTING STREAM (NHD)
- EXISTING WETLAND (NWI)
- EXISTING ARCHAEOLOGICAL SITE
- PROJECT BOUNDARY
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**

*PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

**ANTICIPATED DRAINAGE CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLANS BASED LARGELY ON OBSERVATION OF DRAINAGE CHANNELS/DRAINAGE EROSION FROM THE AERIAL IMAGERY, SUPPLEMENTED BY GIS STREAM LINEWORK AND EXISTING CONTOUR DATA AVAILABLE. ADDITIONAL CROSSINGS (LOW WATER CROSSINGS/CULVERTS) MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.



KEY MAP

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Drawn: DJP

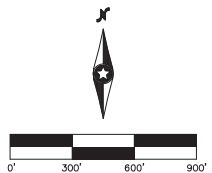
As-Built Drawings

Revisions	DATE	DESCRIPTION
A	08/22/18	30% CIVIL PLANS
B	09/19/18	30% CIVIL PLANS REVISED
C	09/26/18	ISSUED FOR PERMITTING
D	10/02/18	60% CIVIL PLANS

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2025 2nd Avenue NW
West Fargo, ND 58078



**Glen Ullin
Energy Center**

Mercer and Morton Counties,
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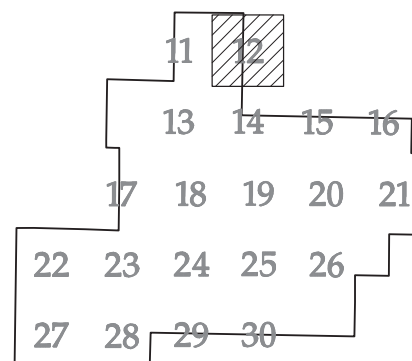
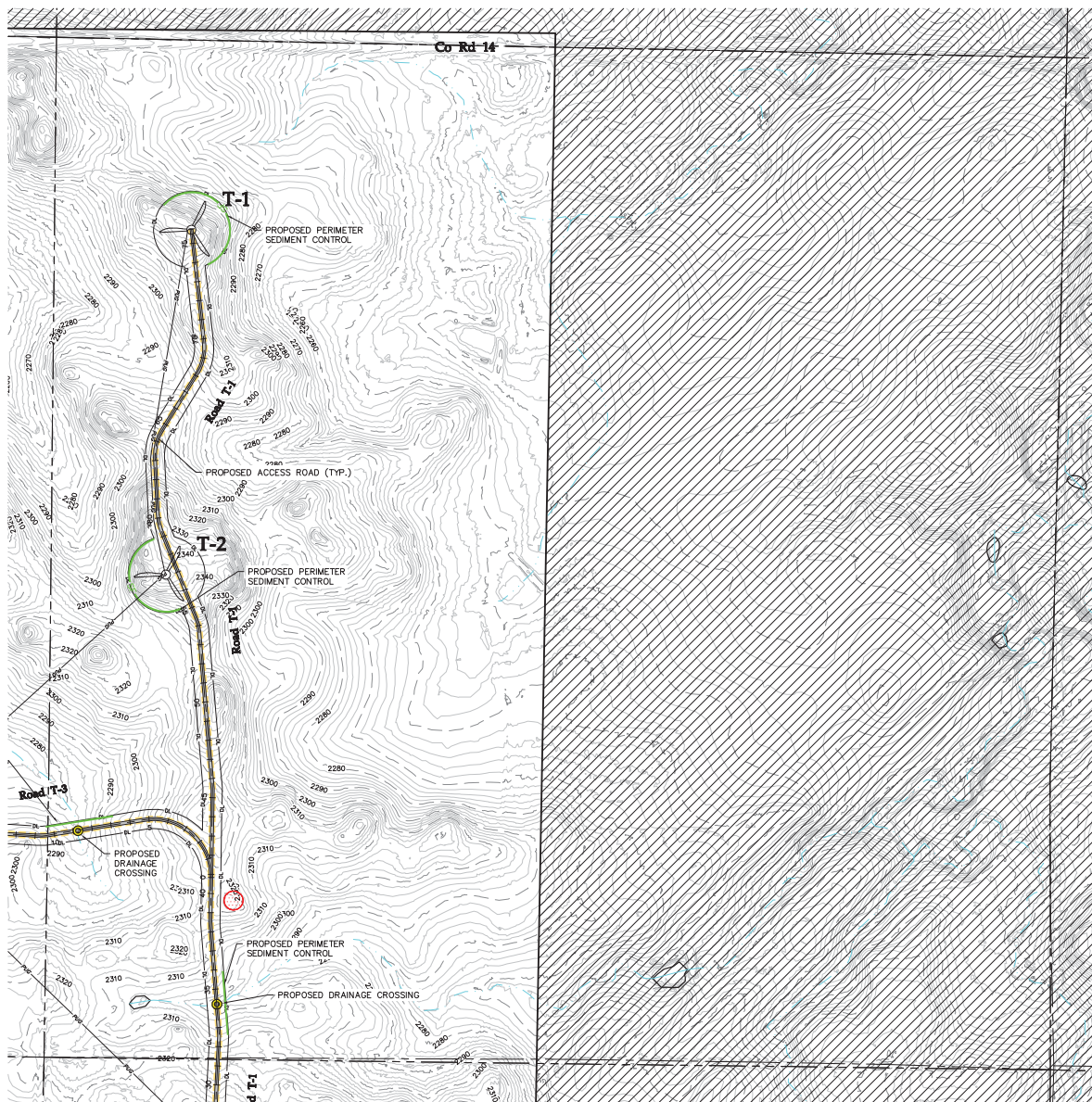
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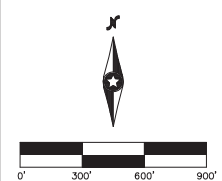
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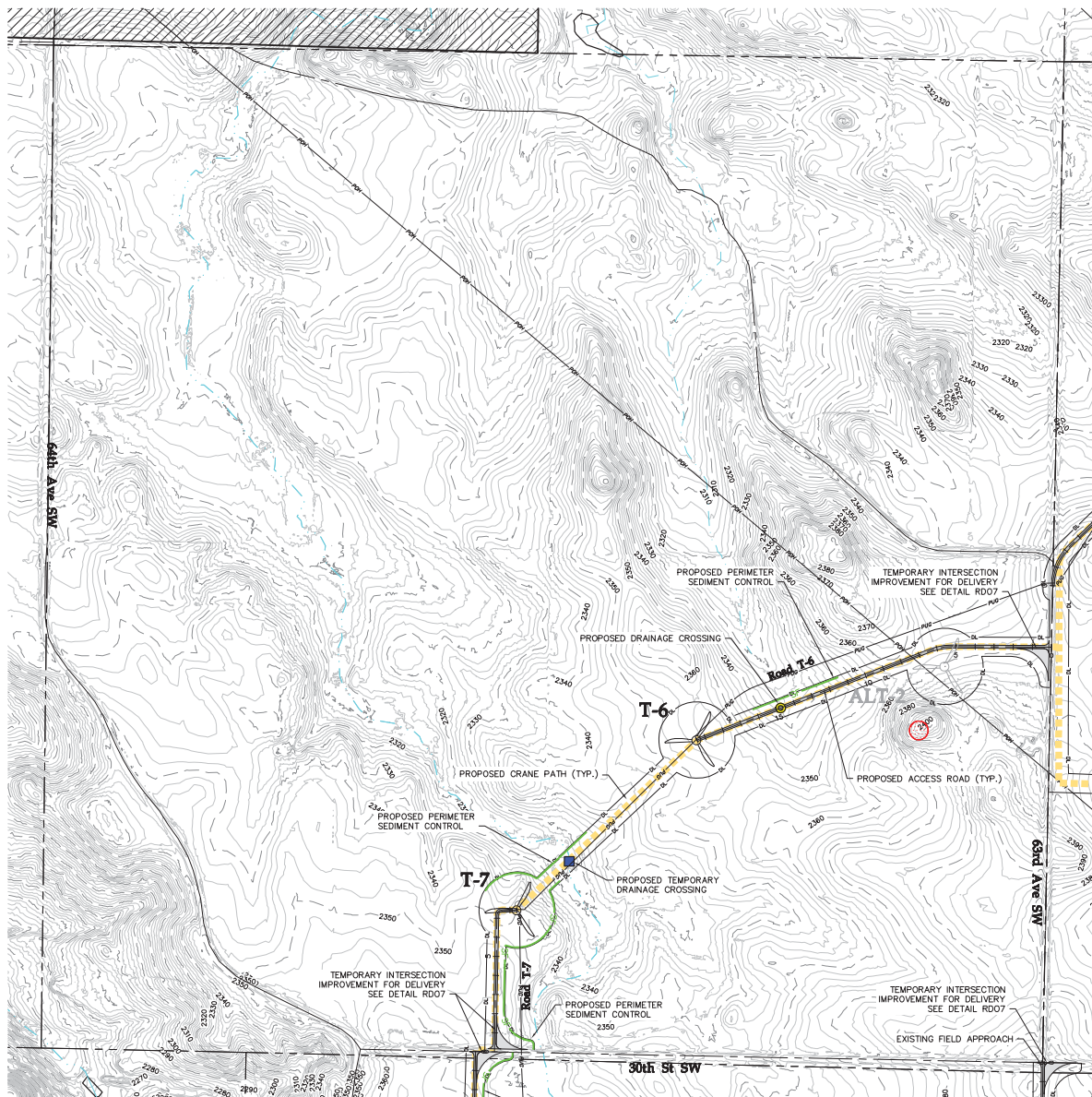
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Sheet: 12 OF 30

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SEE SHEET 11



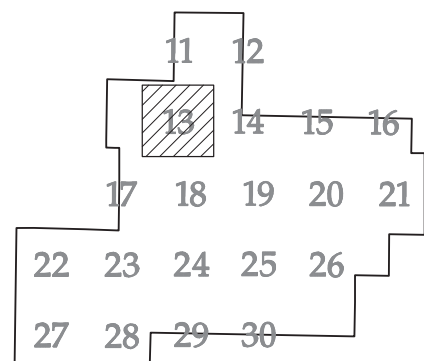
SEE SHEET 18

LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX** PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED COLLECTION LINE*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED SILT FENCE
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
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- EXISTING ROAD (GIS BASED)
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- EXISTING STREAM (NHD)
- EXISTING WETLAND (NHD)
- EXISTING ARCHAEOLOGICAL SITE
- PROJECT BOUNDARY
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**

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Drawn: GSK

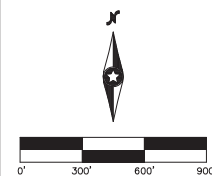
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Glen Ullin Energy Center

Mercer and Morton Counties,
North Dakota

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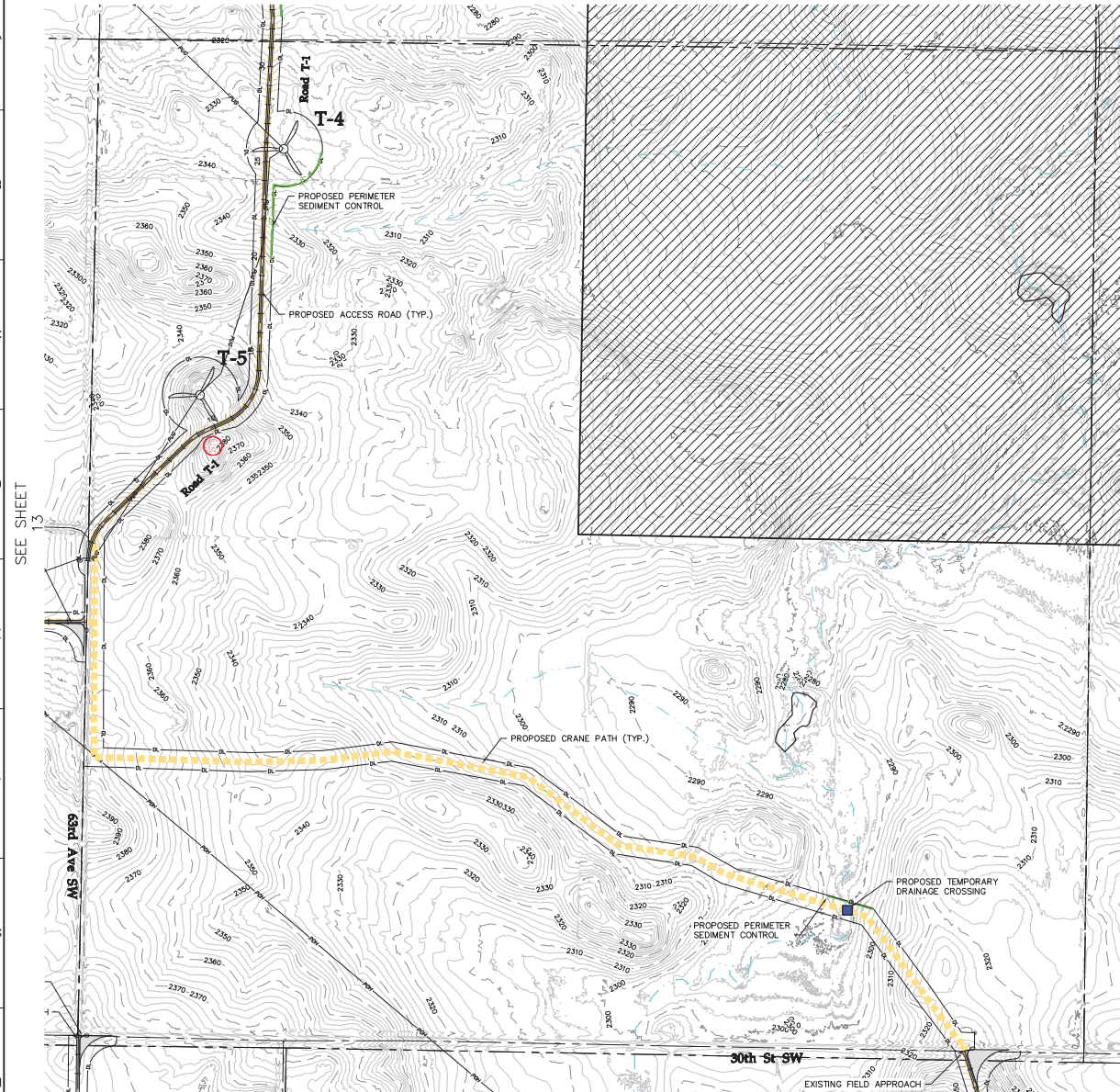
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Sheet: 13 OF 30

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SEE SHEET 12



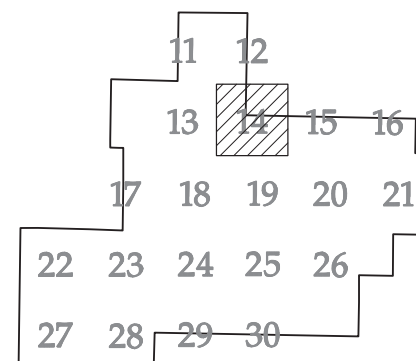
SEE SHEET 19

LEGEND:

- PROPOSED TURBINE LOCATION
- PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PTC ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED COLLECTION LINE*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED SILT FENCE
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING SECTION LINE (GIS BASED)
- EXISTING ROAD (GIS BASED)
- EXISTING OVERHEAD POWER
- EXISTING PIPE LINE
- EXISTING STREAM (NHD)
- EXISTING WETLAND (NWI)
- EXISTING ARCHAEOLOGICAL SITE
- PROJECT BOUNDARY
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**

*PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

**ANTIICIPATED DRAINAGE CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLANS BASED LARGELY ON OBSERVATION OF DRAINAGE CHANNELS/DRAINAGE EROSION FROM THE AERIAL IMAGERY. SUPPLEMENTED BY GIS STREAM LINEWORK AND EXISTING CONTOUR DATA AVAILABLE. ADDITIONAL CROSSINGS (LOW WATER CROSSINGS/CULVERTS) MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 5500
Fax (952) 937-5552 Minneapolis, MN 55443
Web www.westwoodps.com
Westwood Professional Services, Inc.

Designed: DJP
Checked: DJP
Drawn: DJP

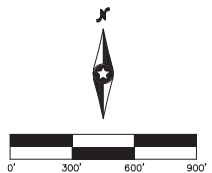
As-Built Drawings

Revision	Date	Description
A	08/22/18	30% CIVIL PLANS
B	09/19/18	30% CIVIL PLANS REVISED
C	09/26/18	ISSUED FOR PERMITTING
D	10/02/18	60% CIVIL PLANS

Prepared for:



3025 2nd Avenue NW
West Fargo, ND 58078



Glen Ullin Energy Center

Mercer and Morton Counties,
North Dakota

Civil Plan Set 4 5

**60% Completion
NOT FOR CONSTRUCTION**

Date: 10/02/18

Sheet: 14 OF 30

0012658SP01.dwg

Designed: DGP
Checked: DGP
Drawn: DGP

As-Built Drawings

Revision	Date	Description
A	08/22/18	30% CIVIL PLANS
B	09/19/18	30% CIVIL PLANS REVISED
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Prepared for:



3025 2nd Avenue NW
West Fargo, ND 58078



Glen Ullin Energy Center

Mercer and Morton Counties,
North Dakota

Civil Plan Set 1

**60% Completion
NOT FOR CONSTRUCTION**

Date: 10/02/18

Sheet: 15 OF 30

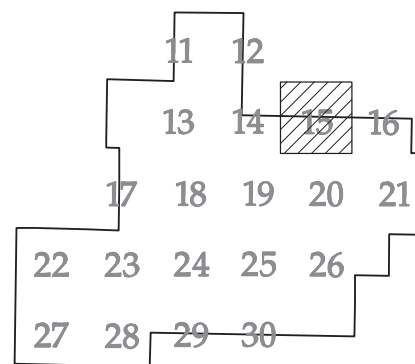
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KEY MAP

SEE SHEET 20

SEE SHEET 16

SEE SHEET 14

Designed: DGP
Checked: DGP
Drawn: DGP

As-Built Drawings

Revision	Date	Description
A	08/22/18	30% CIVIL PLANS
B	09/19/18	30% CIVIL PLANS REVISED
C	09/26/18	ISSUED FOR PERMITTING
D	10/02/18	60% CIVIL PLANS

Prepared for:



3025 2nd Avenue NW
West Fargo, ND 58078



Glen Ullin Energy Center

Mercer and Morton Counties,
North Dakota

Civil Plan Set O&M &
Substation

60% Completion
NOT FOR CONSTRUCTION

Date: 10/02/18

Sheet: 16 OF 30

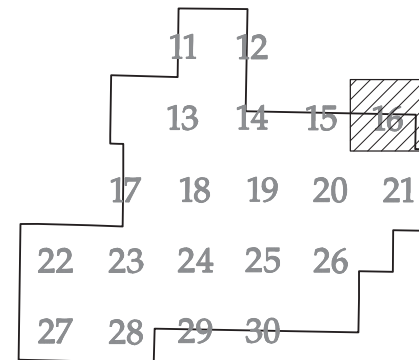
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LEGEND:

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DUE TO CONSTRUCTION ACTIVITIES.



KEY MAP

SEE SHEET 15

PROPOSED O&M AND LAYDOWN YARD (5 ACRES)

TEMPORARY INTERSECTION
IMPROVEMENT FOR DELIVERY
SEE DETAIL RD07

30th St SW

SEE SHEET 21

PROPOSED SUBSTATION